

Appl. No. 10/660,186
Amdt. dated April 13 2006
Reply to Office Action of December 15, 2005

Docket No. A01477

REMARKS/ARGUMENTS

Claims 1-6 and 11-20 remain in this application. Claims 7-10 are withdrawn in response to the restriction requirement stated in the above-identified Office Action. Claims 11-20 are new.

Amendments: Lack of New Matter

Applicant submits that the forgoing claim amendments do not introduce new matter into the present application, as set forth in detail herein below.

In claim 1, the recited list of Michael acceptor functional groups is disclosed in the present specification on page 6, line 5.

In claim 2, the recited skeletons for multi-functional Michael acceptors are disclosed in the present specification as follows:

- Polyhydric alcohols are disclosed on p. 4, line 6. The preference for molecular weight of 200 or greater is disclosed on p. 7, line 19.
- Oligomers and polymers are disclosed on p. 4, line 16. The weight-average molecular weight range that define oligomers and polymers are disclosed on p. 4, line 26 and p. 4, line 30.

In claim 3, Applicants note that "skeleton" of a Michael donor is defined in the present specification as "the portion of the donor molecule other than the Michael donor functional group(s)" (p. 3, lines 6-7). Clearly this definition applies to mono-functional as well as multi-functional Michael donors. Therefore the discussion of suitable "skeletons" (including polyhydric alcohols, oligomers, and polymers, and including disclosed molecular weights) applies to selection of Michael donors used for making the anion of a Michael donor. That is, the recited skeletons (a), (b), and (c) for the anion of a Michael donor recited in amended claim 3 have the same basis in the present specification as the skeletons (a), (b), and (c) in amended claim 2.

In claim 4 and in new claims 19 and 20, polyhydric alcohols are disclosed in the present specification on p. 4, line 6; oligomers and polymers are disclosed on p. 4, line

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16; and the weight-average molecular weight range that define oligomers and polymers are disclosed on p. 4, line 26 and p. 4, line 30. The molecular weight ranges of 5,000 or less; 2,000 or less; and 1,000 or less are disclosed on p. 7, lines 5-8.

New claim 11 recites curable mixtures that contain a multi-functional Michael donor and also contain an anion of that same multi-functional Michael donor. Such an embodiment is described in detail in the present specification on p. 13, lines 3-11.

New claim 12 recites certain specific Michael donor functional groups, which are recited in the present specification on p. 7, line 22 to p. 8, line 1.

New claim 13 is based on the present specification, p. 8, lines 10-11 and lines 18-21.

New claims 14 and 17 are based on the present specification, p. 4, lines 7-10.

New claims 15 and 18 merely select one of the alternatives listed in, respectively, claims 2 and 4.

New claim 16 is based on the present specification p. 11, lines 9-16.

Response to Restriction Requirement

In response to the restriction requirement imposed in the above-identified Office Action, Applicants affirm the election of Group I (claims 1-6) with traverse.

Response to Rejection of claims 2-4 as indefinite

In the above-identified Office Action the Examiner rejected claims 2-4 under 35 USC §112, second paragraph as being indefinite. The Examiner stated that the applicant fails to provide the definition of "molecular weight."

Applicants submit that currently amended claims 2-4 are definite. In the present specification, some of the suitable skeletons are disclosed to be either "polyhydric alcohols" (p. 4, line 6) or, alternatively, "an oligomer or a polymer" (p. 4, line 16). Those of ordinary skill in the art understand the phrase "polyhydric alcohol" to mean a molecule that has multiple (i.e., "poly") hydroxyl groups; polyhydric alcohols are not normally polymeric, and the examples of polyhydric alcohols that are given in the present specification (p. 4, lines 9-13) are non-polymeric. Thus, the molecular weight of the

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polyhydric alcohol, as recited in currently amended claims 2 and 3, is properly specified by the phrase "molecular weight." Also in amended claims 2 and 3, the oligomer and polymer are specified by weight-average molecular weight. Therefore, Applicants submit that all the skeletons recited in currently amended claims 2 and 3 are definite.

Similarly, in currently amended claim 4, when a multi-functional Michael acceptor has a skeleton that is a polyhydric alcohol, the skeleton is non-polymeric, as discussed herein above, and therefore such a multi-functional Michael acceptor itself is non-polymeric. Therefore, such a non-polymeric multi-functional Michael acceptor is properly described using the phrase "molecular weight." Also in currently amended claim 4, when a multi-functional Michael acceptor has a skeleton that is an oligomer or a polymer, such a multi-functional Michael acceptor is itself oligomeric or polymeric and is properly described using the phrase "weight-average molecular weight." Therefore, Applicants submit that currently amended claim 4 is also definite.

Response to rejection of claims 1-4 and 6 over Rheinberger in view of Leake

In the above-identified Office Action the Examiner rejected claims 1-4 and 6 under 35 USC §103(a) as being obvious over US 5,539,017 (Rheinberger) in view of US 6,521,716 (Leake).

Applicants respectfully submit that currently amended claim 1 is not obvious over Rheinberger in view of Leake.

Rheinberger describes Michael cure compositions containing certain Michael donors (e.g., col. 2, line 32), certain Michael acceptors (e.g., col. 2, line 50), and catalyst base (e.g., col. 3, line 57 and col. 4, lines 4-6). Rheinberger fails to teach features of present claim 1, including, for example, as the Examiner noted in the above-identified Office Action, at least one anion of a Michael donor.

Regarding Leake's teachings, Applicants submit that the compositions of Leake's invention contain either a Michael acceptor that is "doubly activated," or a Michael donor that is selected from a specific group of Michael donors, or both. Leake describes the compositions of his invention as follows (Abstract):

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"The double bonds of the Michael acceptor (A) are activated by two adjacent electron withdrawing groups. Alternatively or additionally, the Michael donor (B) contains beta-ketoamide, enamine carboxylate, enamine amide, pyrazonone, isoxazolone, hydantoin, rhodanine, thiosubstituted unsaturated ester, thio-substituted lactone or phosphonite or phosphinite ester groups."

Leake describes in further detail his meaning of a Michael acceptor "activated by two adjacent electron withdrawing groups" in his description of Michael acceptors from col. 2, line 13 to col. 4, line 8, illustrated by his structures (I), (II), (XLV), and (III). A common feature of these acceptors is that one carbon atom of the carbon-carbon double bond is attached to two different electron-withdrawing groups. Leake refers to the carbon-carbon double bond in (I), (II), and (XLV) as "doubly activated" at col. 3, line 42, and he teaches that such structures are "more reactive in Michael curing systems than are polymers containing acrylate or methacrylate ester groups" (col. 3, lines 44-46). Leake further teaches that the carbon-carbon double bond in (III) is also "doubly activated" (col. 3, line 55).

Regarding catalysts, Leake teaches that his compositions "preferably contain a basic catalyst" (col. 21, line 51). As an alternative, Leake teaches that compositions using certain specific Michael donors "cure readily without the use of basic catalysts" (col. 21, lines 52-53). Also, Leake teaches, "Tertiary amine catalysts are usually preferred as basic catalysts" (col. 21, lines 53-54). Leake also states (col. 22, lines 8-13):

"An alternative form of preferred catalyst is an alkali metal salt of an activated methylene compound in which the methylene is activated by two adjacent electron-withdrawing groups, for example the sodium or potassium salt of an acetoacetic ester such as ethyl acetoacetate or a malonate diester such as diethyl malonate"

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Regarding currently amended claim 1:

Among the features recited in currently amended claim 1 are the use of an anion of a Michael donor and the use of a Michael acceptor that has residues of (meth)acrylic acid, fumaric acid, or maleic acid. Applicant submits that the cited references do not teach or suggest this combination of features. None of the Michael acceptors named in currently amended claim 1 fall within Leake's category of "doubly activated" Michael acceptors. Thus, in order to use the teachings of Leake to arrive at the present invention, a practitioner would have to choose, among the alternatives presented by Leake, to use Michael acceptors that are not doubly activated. The practitioner would further have to choose, among the alternative catalysts presented by Leake, to use an anion of a Michael donor. Therefore, Applicants submit that Leake does not teach or suggest the combination of the Michael acceptor and the catalyst (i.e., anion of Michael donor) recited in currently amended claim 1. Further, because Rheinberger does not disclose the anion of Michael donor, Rheinberger does not suggest such a combination of features. Therefore, because neither Rheinberger nor Leake, separately or together, teach or suggest the specific combination of features, Applicants submit that currently amended claim 1 is not obvious over Rheinberger in view of Leake.

The remaining claims are dependent, directly or indirectly, on currently amended claim 1, and Applicants submit they are therefore not obvious over Rheinberger in view of Leake. The remaining claims provide additional features that provide additional reasons why they are not obvious over Rheinberger in view of Leake. Some of those additional reasons are set forth below.

Regarding currently amended claim 2 and new claim 12:

The Michael donors mentioned in Leake's abstract are discussed in greater detail by Leake in col.4 through col. 8, illustrated by Leake's structures (IV) through (XIX). Leake describes these structures as "substantially more active in Michael curing coatings" than various previously-known Michael donors such as acetoacetates, malonates, and amines (col. 8, lines 41-44).

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Leake's teachings, then, involve compositions that have either (or both) of a Michael acceptor that is "doubly activated" or a Michael donor that is "substantially more active" than acetoacetates, malonates, and amines. Leake teaches that the purpose of his invention is to achieve "more rapid ambient curing" (abstract) and that the purpose is achieved by incorporating one or both of such a specific Michael acceptor or such a specific Michael donor into his composition:

In contrast to Leake, the compositions recited in currently amended claim 2 involve the use of both of the following:

- a Michael acceptor with residues of (meth)acrylic, fumaric, or maleic acid, and
- a Michael acceptor with acetoacetoxy functional groups.

Thus, currently amended claim 2 recites the use of both a Michael acceptor that is identified by Leake's teaching as less reactive and a Michael donor that is identified by Leake's teaching as less reactive. Therefore, using both the acceptor and the donor recited in currently amended claim 2 would defeat the purpose of Leake's invention, according to Leake's teaching.

Consequently, Applicants submit that it would not be obvious to use the teachings of Leake in combination with those of Rheinberger or in any other way to arrive at the present invention. Therefore, Applicants submit that currently amended claim 2 is not obvious over Rheinberger in view of Leake.

Similarly, new claim 12 recites the same Michael acceptor as currently amended claim 2. Also, new claim 12 recites a variety of Michael donors, all of which lack the features identified as defining the "more reactive" Michael donors of Leake's invention. Thus, as in the case of currently amended claim 2, new claim 12 involves the use of both a Michael acceptor other than Leake's "doubly activated" Michael acceptors and a Michael donor other than Leake's "substantially more reactive" Michael donor. The combination of Michael donor and Michael acceptor recited in new claim 12 thus would, according to Leake's teachings, defeat the purpose of Leake's invention. Therefore

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Applicants submit that new claim 12 is not obvious over Rheinberger in view of Leake, for the same reasons set forth herein above regarding currently amended claim 2.

Regarding currently amended claim 3:

Leake's discussion of alkali metal salts of activated methylene compounds (col. 22, lines 8-12, quoted herein above) do not disclose or suggest alkali metal salts of the specific acetoacetoxy functional molecules recited in currently amended claim 3. Also, Rheinberger does not disclose the use of such salts at all. Therefore, neither Rheinberger nor Leake disclose or suggest the reaction products of the specific acetoacetoxy functional molecules recited in currently amended claim 3 with an alkali metal oxide. Consequently, Applicants submit that such reaction products constitute a feature of currently amended claim 3 that is not taught or suggested in either Rheinberger or Leake. Therefore, Applicants submit that currently amended claim 3 is not obvious over Rheinberger in view of Leake.

Regarding new claim 11

Neither Rheinberger nor Leake teach or suggest compositions that contain both a Michael donor and also an anion of that same Michael donor. Applicants submit that new claim 11 is therefore not obvious over Rheinberger in view of Leake.

Regarding remaining claims (currently amended claim 4, original claims 5 and 6, and new claims 13-20):

The remaining claims are dependent, directly or indirectly, on one of currently amended claims 1, 2, or 3, or new claims 11 or 12. Therefore Applicant submits that the remaining claims are likewise not obvious over Rheinberger in view of Leake.

Response to rejection of claim 5 over Rheinberger in view of Leake and Dammann

In the above-identified Office Action the Examiner rejected claim 5 under 35 USC §103(a) as being obvious over Rheinberger in view of Leake and further in view of US 6,706,414 (Dammann).

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Present claim 5 is dependent on currently amended claim 1. In view of the amendments and arguments presented herein above showing that currently amended claim 1 is not obvious, Applicants submit that present claim 5 is likewise not obvious.

Conclusion

In view of the foregoing amendments and arguments, Applicants respectfully request the Examiner to reexamine the claimed subject matter, to withdraw the rejections of the claimed subject matter and to allow claims 1-6 and 11-20 at this time. If, however, there remain any open issues which the Examiner believes can be resolved by a telephone call, the Examiner is cordially invited to contact the undersigned agent.

A petition for one month extension of time and a fee of \$120 is submitted herewith. No additional fees are believed to be due in connection with the submission of this amendment; however, if any such fees, including petition or extension fees, are due, the Commissioner is hereby authorized to charge them, as well as to credit any overpayments, to Deposit Account No. 18-1850.

Respectfully Submitted,



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